

LAB**A Simple Musical Instrument****Background**

There are many different types of musical instruments. Early instruments were made from materials that were easily obtained such as clay, shells, skins, wood, and reeds. These materials were fashioned into various instruments that produced pleasing sounds. In this lab, you are going to create a musical instrument using materials that are available to you, just as your ancestors did.

Question

How can you control pitch in an instrument?

Materials

test tubes
test-tube rack
water

Objectives

- **Demonstrate** how to make music using water and test tubes.
- **Predict** how the tones will change when there is more or less water in the test tubes.

Safety Precautions**Procedure**

1. Read the procedure and safety information, and complete the lab form.
2. Put different amounts of water into each of the test tubes.
3. **Predict** any differences you expect in how the tones from the different test tubes will sound.
4. Blow across the top of each test tube.
5. **Record** any differences that you notice in the tones that you hear from each test tube.

Data and Observations

Test tube	Amount of water	Tone difference
A		
B		
C		
D		

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Conclude and Apply

1. Describe how the tones change depending on the amount of water in the test tube.

2. Explain why the pitch depends on the height of the water.

3. Summarize why each test tube produces a different tone.

4. Explain how resonance amplifies the sound from a test tube.

5. Explain how the natural frequencies of the air columns in each of the tubes differ.

6. Infer how you might control the pitch in a flute.

Communicate Your Data

Discuss When you are listening to music with family or friends, describe to them what you have learned about how musical instruments produce sound. Write a brief summary of your discussion.